

Amendments to the Claims:

The following list of claims replaces all previous versions and listings of claims in the above-identified application.

Listing of Claims:

1. (previously amended) A method for single molecule identification of a target DNA molecule in a random coil state comprising the following steps:
 - a) forming two or more different optically distinguishable DNA sequence recognition units by attaching a unique, optically distinguishable material to each of the two or more DNA sequence recognition units;
 - b) hybridizing each of said two or more DNA sequence recognition units to said target DNA molecule in a random coil state to form a hybridized DNA complex in a random coil state;
 - c) stretching said hybridized DNA complex in a random coil state to form a hybridized DNA complex in a substantially linear configuration; and
 - d) detecting said optically distinguishable DNA sequence recognition units in a sequential manner along said substantially linear hybridized DNA complex, thereby identifying said target DNA molecule,wherein the optically distinguishable materials have a size of about 0.05 μm or greater.
2. (previously amended) The method of claim 1 wherein said optically distinguishable material comprises one or more colored microparticle.
3. (previously amended) The method of claim 1 wherein said optically distinguishable material comprises one or more microparticle, each microparticle having a different shape.
4. (previously amended) The method of claim 2 wherein each of said one or more colored microparticle comprises one or more dye, dye aggregate, pigment, or nanocrystal.

5. (previously amended) The method of claim 1 wherein each of said two or more DNA sequence recognition units comprises DNA, DNA fragments, synthetic oligonucleotides or peptide nucleic acids.

6. (previously amended) The method of claim 1 wherein each of said two or more DNA sequence recognition units comprise any protein scaffold or synthetic molecular moiety capable of recognizing a specific DNA sequence.

7. (original) The method of claim 1 wherein said stretching of said hybridized DNA complex in a random coil state to form a hybridized DNA complex in a substantially linear configuration is accomplished by using a mechanical means.

8. (previously amended) A method for single molecule identification of a target DNA molecule in a random coil state comprising the following steps:

a) stretching said target DNA molecule in a random coil state to form a substantially linear configuration;

b) forming two or more different optically distinguishable DNA sequence recognition units by attaching a unique, optically distinguishable material to each of the two or more DNA sequence recognition units;

c) hybridizing said DNA sequence recognition units to said target DNA molecule in a substantially linear configuration to form a hybridized DNA complex in a substantially linear configuration; and

d) detecting said optically distinguishable DNA sequence recognition units in a sequential manner along said substantially linear hybridized DNA complex, thereby identifying said target DNA molecule,

wherein the optically distinguishable material has a size of about 0.05 μm or greater.

9. (previously amended) The method of claim 8 wherein said optically distinguishable material comprises one or more colored microparticle.

10. (previously amended) The method of claim 8 wherein said optically distinguishable material comprises one or more microparticle, each microparticle having a different shape.

11. (previously amended) The method of claim 9 wherein each of said one or more colored microparticle comprises one or more dye, dye aggregate, pigment, or nanocrystal.

12. (previously amended) The method of claim 8 wherein each of said two or more DNA sequence recognition units comprises DNA, DNA fragments, synthetic oligonucleotides or peptide nucleic acids.

13. (previously amended) The method of claim 8 wherein each of said two or more DNA sequence recognition units comprise any protein scaffold or synthetic molecular moiety capable of recognizing a specific DNA sequence.

14. (original) The method of claim 8 wherein said stretching of said hybridized DNA complex in a random coil state to form a hybridized DNA complex in a substantially linear configuration is accomplished by using a mechanical means.